

35mm CAMERA KIT

MODEL AK-540 / FUN-545



Assembly and Instruction Manual

WARNING: CHOKING HAZARD- SMALL PARTS NOT FOR CHILDREN UNDER 3 YEARS.


Elenco Electronics, Inc.

PARTS LIST

Qty.	Name	Description	Part #
<input type="checkbox"/> 1	-	Small Screwdriver	6AK54001
<input type="checkbox"/> 1	A1	Film advance.....	6AK54002
<input type="checkbox"/> 1	A2	Film advance base.....	6AK54009
<input type="checkbox"/> 1	A3	Film advance shaft	6AK54003
<input type="checkbox"/> 1	A4	Film holder.....	6AK54004
<input type="checkbox"/> 1	A5	Wide clip.....	6AK54024
<input type="checkbox"/> 1	A6	Film holder shaft.....	6AK54005
<input type="checkbox"/> 1	A7	Thin clip.....	6AK54025
<input type="checkbox"/> 1	A8	Wide spring.....	6AK54026
<input type="checkbox"/> 1	A9	Film advance knob.....	6AK54006
<input type="checkbox"/> 0	A10	Film counter reset spring (SEE NOTE AT BOTTOM)	-
<input type="checkbox"/> 1	B1	Shutter control.....	6AK54007
<input type="checkbox"/> 1	B2	Film counter frame (SEE NOTE AT BOTTOM).....	6AK54008
<input type="checkbox"/> 0	B3	Film counter reset (SEE NOTE AT BOTTOM)	-
<input type="checkbox"/> 1	B4	Thin spring.....	6AK54027
<input type="checkbox"/> 1	C1	Rewind base	6AK54010
<input type="checkbox"/> 1	C4	Rewind shaft	6AK54013
<input type="checkbox"/> 1	C5	Film door latch	6AK54015
<input type="checkbox"/> 1	D5	Shutter release.....	6AK54016
<input type="checkbox"/> 1	D6	Lens frame.....	6AK54017
<input type="checkbox"/> 1	D7	Lens	6AK54040
<input type="checkbox"/> 1	D8	Lens Guard	6AK54041
<input type="checkbox"/> 1	E1	Large viewfinder lens.....	6AK54033
<input type="checkbox"/> 1	E2	Small viewfinder lens.....	6AK54034
<input type="checkbox"/> 1	E3	Film door.....	6AK54019
<input type="checkbox"/> 1	E4	Rear case.....	6AK54020
<input type="checkbox"/> 1	F1	Lens cover.....	6AK54018
<input type="checkbox"/> 1	F2	Shutter release button.....	6AK54014
<input type="checkbox"/> 1	F3	Strap	6AK54022
<input type="checkbox"/> 1	F4	Front case	6AK54023
<input type="checkbox"/> 1	G1	Camera frame.....	6AK54021
<input type="checkbox"/> 9	G2	Small-head screw (actual number included will vary with model).....	6AK54032
<input type="checkbox"/> 0	G3	Medium-head screw (SEE NOTE AT BOTTOM)	-

NOTE: Items A10, B3, and G3 may have come pre-installed onto item B2.

PARTS IDENTIFICATION

<p>Film Advance A1</p> 	<p>Film Advance Base A2</p> 	<p>Film Advance Shaft A3</p> 	<p>Film Holder A4</p> 	<p>Wide Clip A5</p> 
<p>Film Holder Shaft A6</p> 	<p>Thin Clip A7</p> 	<p>Wide Spring A8</p> 	<p>Film Advance Knob A9</p> 	<p>Film Counter Reset Spring A10</p> 
<p>Shutter Control B1</p> 	<p>Film Counter Frame B2</p> 	<p>Film Counter Reset B3</p> 	<p>Thin Spring B4</p> 	<p>Rewind Base C1</p> 
<p>Rewind Shaft C4</p> 	<p>Film Door Latch C5</p> 	<p>Shutter Release D5</p> 	<p>Lens Frame D6</p> 	<p>Lens D7</p> 
<p>Lens Guard D8</p> 	<p>Large Viewfinder Lens E1</p> 	<p>Film Door E3</p> 	<p>Rear Case E4</p> 	<p>Lens Cover F1</p> 
<p>Shutter Release Button F2</p> 	<p>Strap F3</p> 	<p>Front Case F4</p> 	<p>Camera Frame G1</p> 	<p>Small-Head Screw G2</p> 
				<p>Medium-Head Screw G3</p> 

INTRODUCTION

The AK-540 is a mechanical camera kit that you put together. It uses standard 35mm film, requires no focusing, and has a built-in lens cover. It is manually operated and requires no batteries. It does not have flash and so is best for outdoor use, but can be used indoors with proper lighting. Nothing is needed for assembly as it even comes with its own screwdriver.

Recommended for ages 10 and up.

WARNING:

This kit contains small parts and should be kept out of the reach of small children.

THEORY OF OPERATION

Lenses:

When light, whether from the sun or from a light bulb, shines on an object (or a person) some of the light is absorbed into the object and some is scattered in all directions (see Fig. 1). If any of the scattered light reaches your eyes then you can “see” the object, the colors you see are the colors that were scattered. The amount of light which reaches your eyes (the “brightness”) depends on how strong the original light source was and how much of that light was absorbed or scattered by the object. You see white when something scatters all of the light reaching it and absorbs none, you see bright colors (like orange, yellow, pink, light green, and light tan) when most of the light is scattered, you see dark colors (like blue, purple, brown, dark red, and dark green) when most of the light is absorbed, and black when all the light is absorbed. At night, objects with bright colors are easier to see than objects with dark colors because they scatter more of what little light is present. Light which is absorbed is changed into heat; notice how sunlight warms you and how actors and singers can get very warm under studio lights. Also notice how you feel much cooler wearing a white shirt on a hot sunny day than wearing a black shirt (because white scatters the light while black absorbs it).

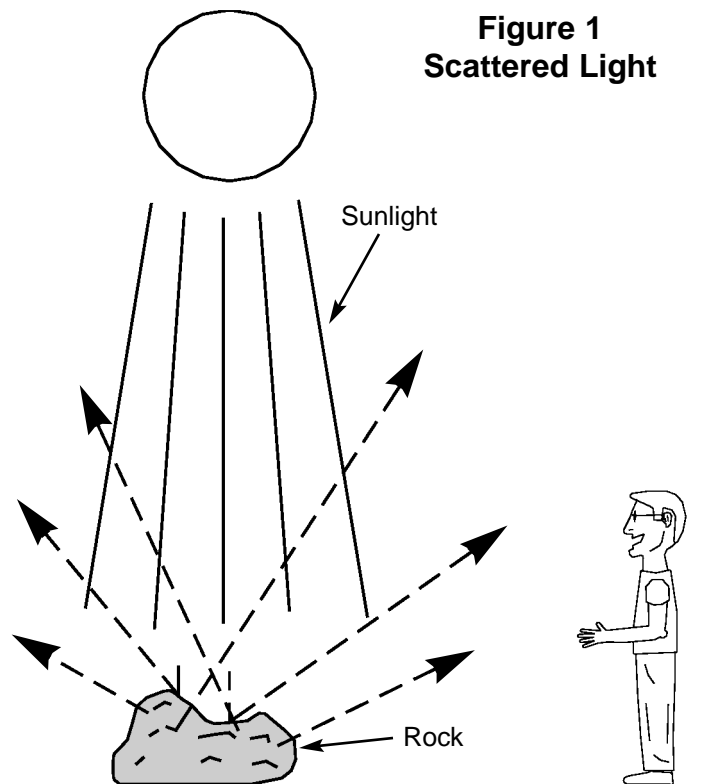
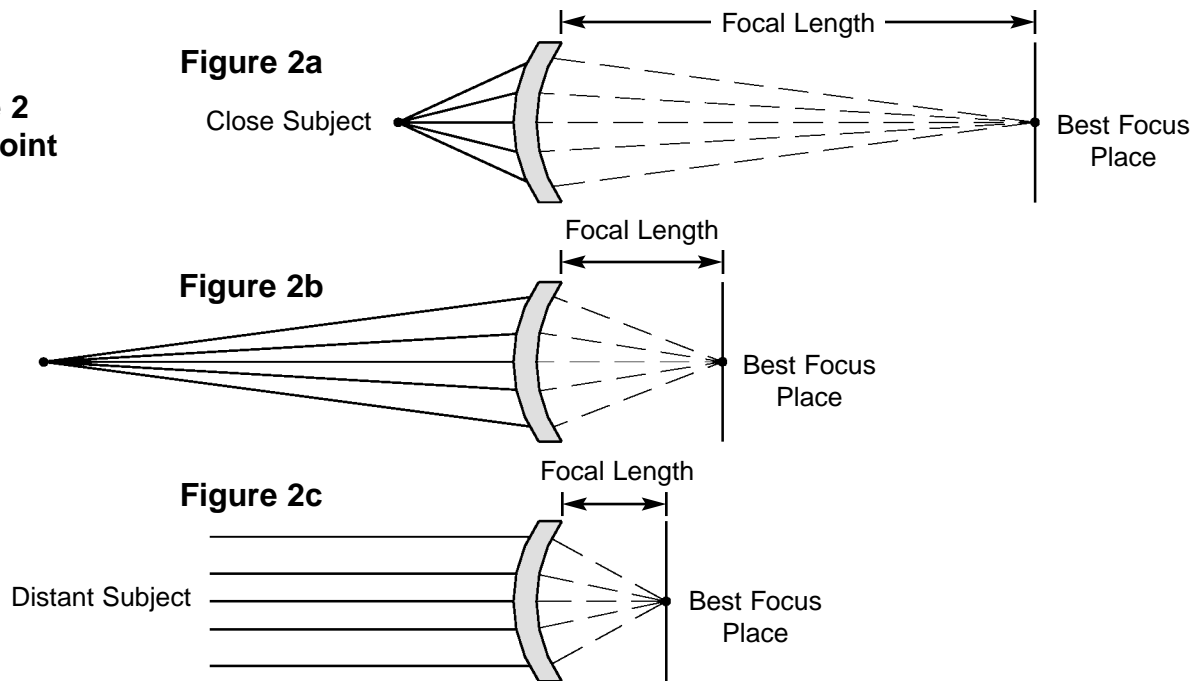


Figure 1
Scattered Light

Just as some of the scattered light reaches your eyes, some also reaches your AK-540 camera. When you press the button to open the shutter light passes through the lens to the film. When a beam of light passes through the lens its angle is changed (it is “bent”) since light travels differently through the lens than through air, in the same way as it does between water and air. (For example, try looking through a clear glass of water to something on the other side. You won’t be able to see it clearly). The lens is used to concentrate (“focus”) light onto a single point so that an image may be produced (the same thing happens inside your eyes). The focus point is where you want to place the film for the best image. Unfortunately, the focus point depends on how far away from the camera your subject is, as shown in Figure 2. Take something small (your finger or your camera) and hold it about 4 inches from your eyes. Then try to look at it and at something on the other side of the room at the SAME time so that neither is blurred. You can’t do it; your eyes can only focus on one or the other. The same is true for all cameras - you cannot get clear pictures of close and distant objects at the same time.

Fortunately, since the lens and film must fit in a small camera and so will usually be less than an inch apart (the focal length), the best focus point for anything more than a few feet from the camera doesn’t change much (see Fig. 2c). This allows cameras to be designed using a fixed focus setting (around 10 feet usually) while still producing good pictures (at any distance above 4 feet). These popular cameras are generally referred to as

Figure 2
Focus Point



“point and shoot” cameras (because they are easy to use) and includes your AK-540. More advanced cameras have a knob for you to adjust the focus or use infrared light and sensors to measure the distance to their subject and then automatically adjust the focus. While automatic focus adjustment usually works great, in a crowded scene it may not always select the subject you wanted it to focus on.

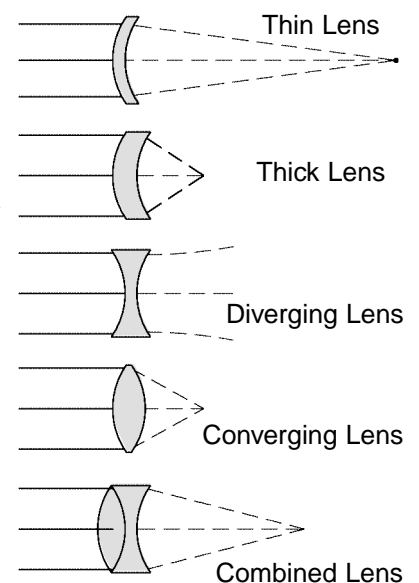
Your eyes are amazing instruments and can quickly focus on whatever interests you, but even they are not perfect. Most people cannot focus on something 3 inches away. Someone who is nearsighted may be able to focus on something 2 inches away but won’t be able to focus across the room.

In a perfect lens, the focused light would all come to a single point. But we cannot build perfect lenses. Construction defects cause the bending of light to vary slightly throughout the lens. The shape and thickness of the lens produce different bending effects on light (see Figure 3 for examples), and construction defects cause these to vary. Despite the use of lens covers, dust can get on the lens and distort the focus. In advanced cameras, lens design and construction are very complex. Lenses come in a wide range of shapes to produce different bending effects on light. Most cameras use a combination of several lenses to reduce the effects of construction defects.

The length from the lens to the film is called the focal length. If this length can be changed, while keeping focus on the same subject, then our subject would appear to be larger or smaller (as if we moved closer to or farther away from it). See Figure 4. Reducing the focal length (so that the subject appears to be farther away) is called “zooming-out” and increasing the focal length (so that the subject appears to be closer) is called “zooming-in” or “telephoto”. This is done by changing lenses or using an adjustable (“zoom”) lens. Focus is kept by using several lenses (only changing the focal length for some of them) and by other adjustments. Notice that zooming-in is similar to using a magnifying glass.

Since you want to know what will be in your pictures before you take them, you have a viewfinder. The viewfinder on your AK-540 uses two lenses (one diverging and one combination, see Figure 3) to create a picture that, combined with your eyes, has the same view and focus as what will appear on film (except at very close, since your eyes can adjust focus while the camera cannot). Notice that everything seen through the viewfinder appears to be only about half its true size. The reason for this is that your eyes see things the way a 50mm (2 inch) focal length does but your AK-540 camera has only a 27mm (about 1 inch) focal length. 50mm lenses are unpopular because their field of view is too small (most cameras use 35mm). This field of view is not a problem for our eyes because

Figure 3
Types of Lenses



they are constantly looking around and have a limited ability to see things outside their main field of view (this is called our peripheral vision), but it is a problem when taking photographs. For closer pictures, 70mm (2.8 inches) lenses are more popular than 50mm.

Light and Film:

After the lens, the light passes through the small plastic hole (in the back of lens frame D6) and reaches the film. As seen in Figure 5, the image will be upside down after passing through this hole. This hole is called the aperture. It controls the amount of light reaching the film. Advanced cameras (and our eyes, in a similar manner) measure the light present and adjust the aperture size to give best results.

To demonstrate this, take a close look at your pupils (the large black dots in the center of your eyes) using a mirror or with a friend. The pupil acts like an aperture. Darken the room (by dimming the lights or shading your eyes) so that you can barely see your pupils and observe their size. Now make the room very bright (go next to a bright light or shine a flashlight in your eyes) and see if your pupils have changed. They should be large when the room is dark and small when the room is bright. You may also have seen your eyes take a few seconds to adjust after moving from a very bright room to a very dark room or the reverse.

The aperture (along with the focus distance and the lens focal length to lesser degrees) also controls the “depth of field”, which is how far around the focus distance things appear to be reasonably in focus. For small apertures, such as for point and shoot cameras, the depth of field is very large (anything greater than 4 feet will be in focus). But for large apertures the depth of field may only be a few feet in front of and behind the subject. This effect is used to blur distracting objects close to the camera or in the background, and is often used in advertising. See Figure 6 for an example.

The movement of lens shutter D1 to allow light to pass to the lens and film needs to be very fast. If the camera (due to shaking) or anything in the picture is moving then the light pattern reaching the film will vary and as a result the photograph will be blurred, the same as if it were out of focus. The shutter speed is also another way of controlling the amount of light reaching the film. Your AK-540 has a shutter speed of 1/125 seconds.

What is film and how is it developed? The answers to these two questions are very long and complex, and would quickly put most people to sleep. Please refer to the “For Further Reading” section if you would like to know more. Basically film is light-sensitive material that retains an image after it has been exposed to light. The material consists of silver compounds which change

Figure 4 - ZOOM

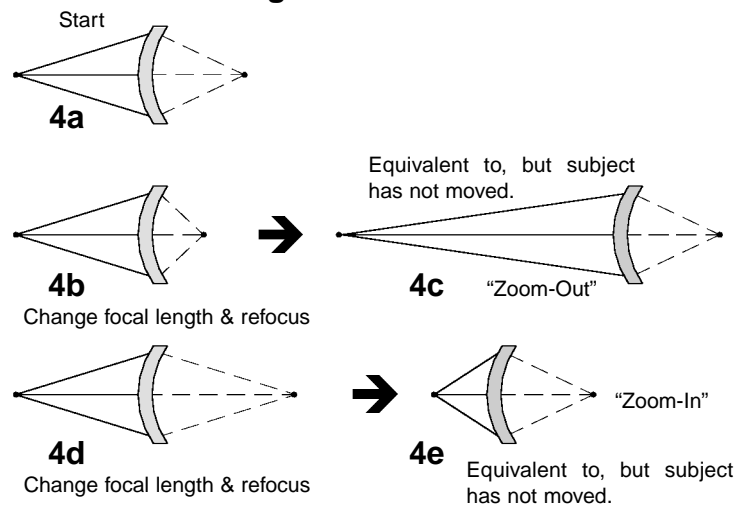


Figure 5 - Inverting Light as it Passes Through Aperture

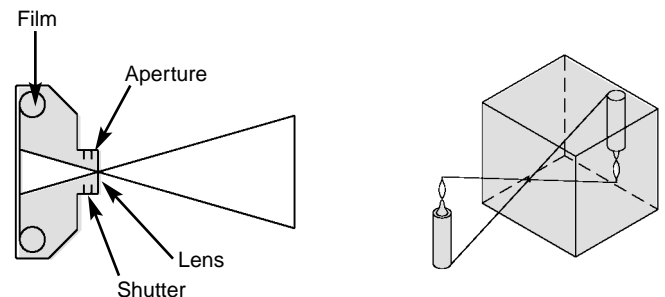


Figure 6

into silver metal when exposed to light. Through a complicated process, called photofinishing or photo development, the image is converted to an image on special paper. Black-and-white film consists of a single layer of silver compounds while color film consists of three layers, each sensitive only to blue, red, or green light. By combining different amounts of blue, red, and green, any color may be produced as shown in Figure 7. Note that white is produced when all three colors are at full brightness and black is produced when all three have no brightness (no light is present). The same idea is used in your color TV set. Turn on your TV and look at it very closely with a magnifying glass (if you don't have a magnifying glass then place your AK-540 camera against your TV and look through the viewfinder). You will see that your entire TV screen consists of blue, red, and green dots of varying brightness.

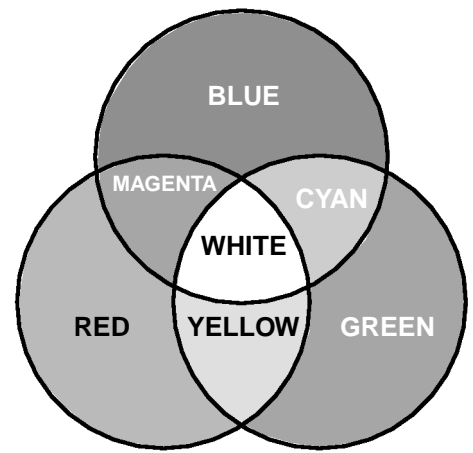


Figure 7

Film remains sensitive after it is first exposed to light and must be kept in darkness until photofinishing is complete. For this reason, photofinishing work is done in a room called a “darkroom”. In very unusual situations, such as for special effects in the movies, a second exposure is used. If done correctly, this may be used to give the appearance of ghosts. “Time-lapse” photography uses many exposures spread over a long time or one continuous exposure (with the background and light conditions the same) to show how something moves. This could be used to show the growth of a plant.

The light-sensitivity of the silver compounds can be varied. This is called the film “speed” or the ASA (American Standards Association) rating. (The ISO, for International Standards Organization, rating is also used and is the same as the ASA scale). Slower speeds, such as ASA 100 or lower, are less sensitive to light and have the advantages of giving more detailed pictures (very important if you plan to make big enlargements), can use slower shutter speeds, and are less expensive. Faster speeds, such as ASA 400 or higher, are more sensitive to light. They have the advantage of requiring less light and can use faster shutter speeds. This is very important for action shots where the subject is moving. The more the subject moves while the shutter is open, the more blurred the final picture will be. Your AK-540, as with most point and shoot cameras, works with speeds of ASA 100, 200, or 400 (400 is preferred).

The most common problem with taking good pictures is difficult light conditions. Even the best cameras have a harder time with lighting than your eyes do. Pictures of people come out best with normal daylight, but sunshine, shade, sun glare, bright colors, dark colors, and house lights make things difficult. Movie studios, television studios, and concert halls have bright lights to ensure good results. Pictures of sunrises and sunsets are challenging because the sky is bright while the ground is very dark.

You now know three ways to take good pictures in low light: larger aperture, faster lens shutter speed, and faster film speed. Unfortunately, only advanced cameras allow you to change aperture size or shutter speed, and you can only have one speed of film in your camera at a time. However, since most simple cameras are used to take pictures of people at close distances, the “flash” feature was developed. Flash cameras produce a burst of light (the “flash”) towards the subject just before the picture is taken. This makes sure that the subject (usually people) has enough light to photograph well.

Mechanical Operation of the AK-540:

(This section is easier to understand if you read it after building the camera.) Turning the film advance knob A9 turns film advance A1 which has tabs that pull the film out of its cartridge. The “teeth” on the lower section of the film advance knob interlock with those on film holder shaft A6, turning it and film holder A4, which wraps up the exposed film. The small tab at the top of film advance shaft A3 advances the film counter (part of B2) one count for each picture taken. After turning once around, the film advance knob A9 has a tab which locks on shutter control B1 until a picture is taken. Advancing the film also stretches spring B4, which is attached to B1.

When the shutter button is pressed to take a picture, stretched spring B4 is released moving shutter control B1 back to the side of the camera. Part of B1 extends downward and catches briefly on lens shutter D1, opening it briefly and exposing the film. The movement of B1 also releases the lock between it and film advance knob A9, so the film may be advanced for the next shot.

Film counter frame B2 includes a spring which stretches as the film is advanced. While closed, the film door E3 pushes film counter reset B3 against the film counter (part of B2) and prevents its spring from resetting the count. If the film door is opened B3 releases the film counter and its spring resets the count to zero.

Pressing the rewind button (film advance shaft A3 sticking out of the camera bottom) releases the film advance mechanism and allows the rewinder (shaft C4 and handle C2) to rewind the film back into its cartridge.

The lens cover switch uncovers the lens (but does not open the shutter) when opened and protects the lens and locks the shutter button (to prevent accidental pressing of the shutter button) when closed.

ASSEMBLY INSTRUCTIONS

Install parts that have the same letter in their name in numerical order (install B2, then B3, then B4, etc.) unless otherwise stated.

- 1. **Match parts:** Match up all of the parts to their pictures in the Parts List. (Check to see that nothing was damaged during shipping.) After the part bags are open, you should store the parts on a plate or shoe box since the small parts are easy to lose.

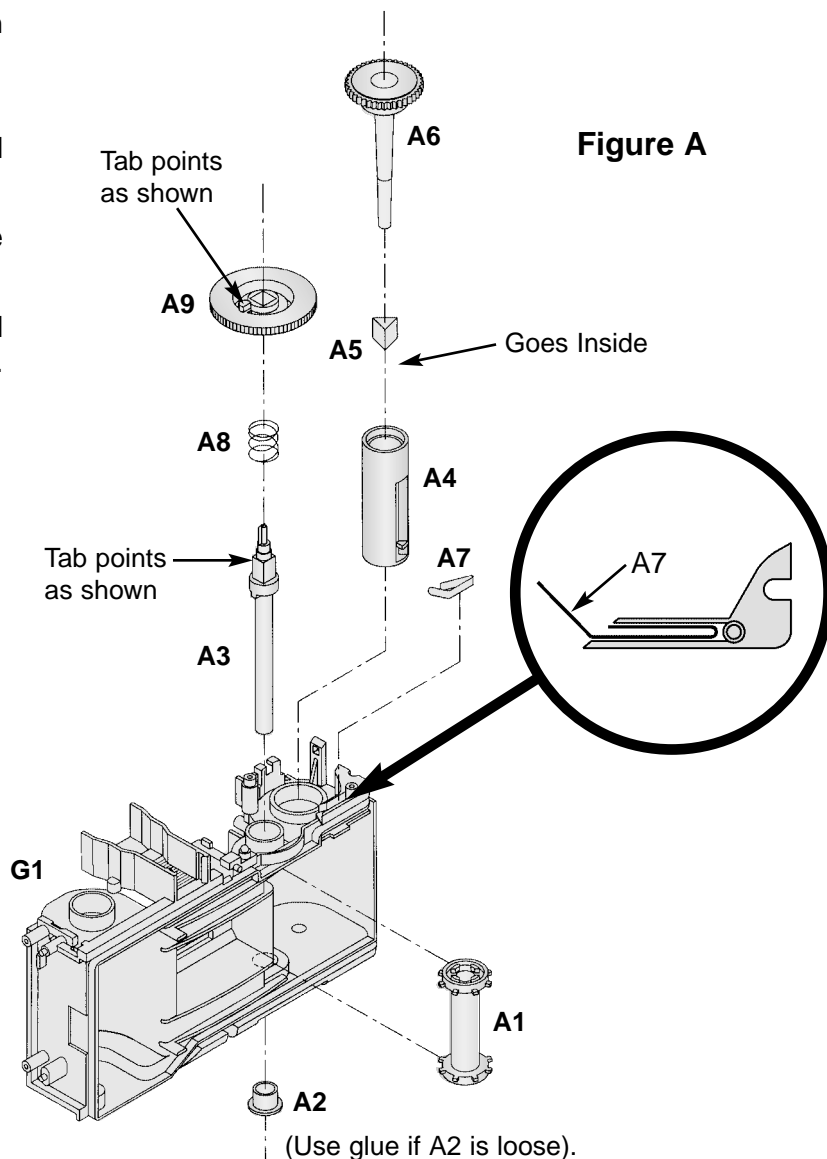
- 2. **A Parts:** Assemble the A parts as shown in Figure A in the following order:
A5 • A4 • A6 • A1 • A2 • A3 • A8 • A9 • A7

A2 should fit snugly into G1; if it is loose and falls out, then use glue to hold it in place.

The tabs on the tops of A3 and A9 should be pointed away from A6, as shown.

A9 may initially be very loose but if pressed down will align with A6 and be able to turn it.

A7 will rest against A9.



Note: The camera frame (G1) is sometimes packaged alongside the rear case (E4). In rare cases, they may have snapped together during shipping.

If so, CAREFULLY snap them apart as per Figure E on page 10.

- 3. **B Parts:** Assemble B1 as shown in Figure Ba. Note that the tabs on A3 and A9 must be pointed as shown. Press down A9 and then hold B1 on top of it. The two holes in B1 fit around two tabs (one round, one rectangle) and can slide along them. Place B2 on top of B1, snapping it in as shown in Figure Bb. Both B1 and B2 should now be laying flat. Assemble A10, B3 and G3 as shown in Figure Bc (these, or a similar mechanism, may have come already installed on B2). Be sure you install B2 with B3 positioned in G1 as shown. Install the G2 screws IN THE ORDER SHOWN and BE SURE THEY ARE TIGHT or the film-advance mechanism may not work. The third screw shown is not needed in most models, you should install it only if it extends into something besides B2. You may use the screwdriver included with this kit or your own.

Before installing spring B4, you should do a quick test. Turn A9 (the film advance knob) to the right (it won't go the other way) until it stops. (If it is already stopped, you can release it by pulling B1 to the right using the tab that B4 will attach to). The tab on A3, sticking up through B2, should be pointed away from the film counter (part of B2). If this is correct then install B4 and continue with step 4; if this is wrong, remove B1 and B2 and re-orient the tabs on A3 and A9 because your film counter reset may not work.

Now install B4 as shown in Figure Bc.

Figure Ba

Tabs on A3 & A9 must be pointed as shown

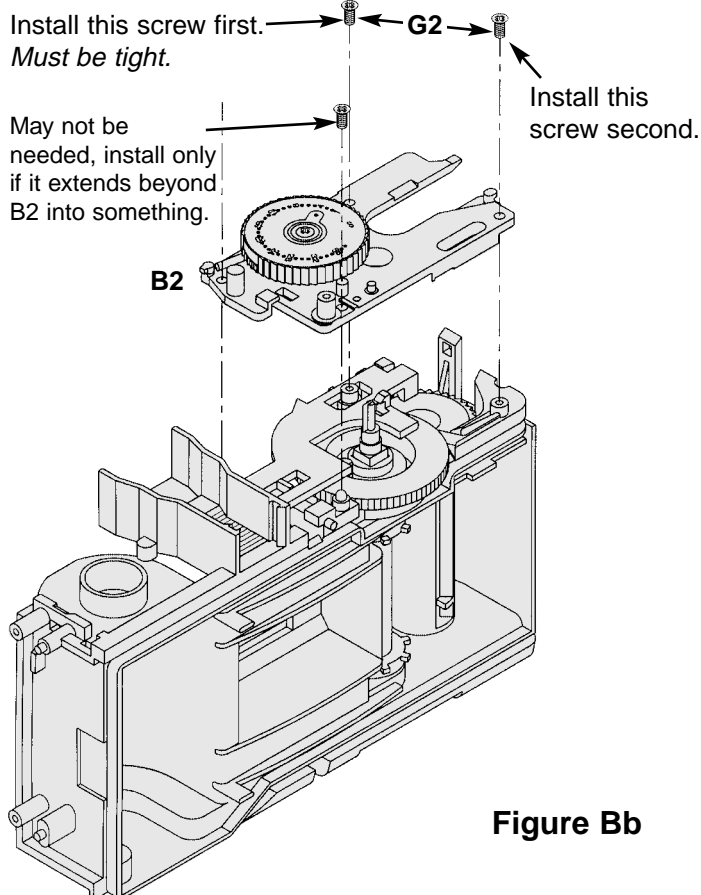
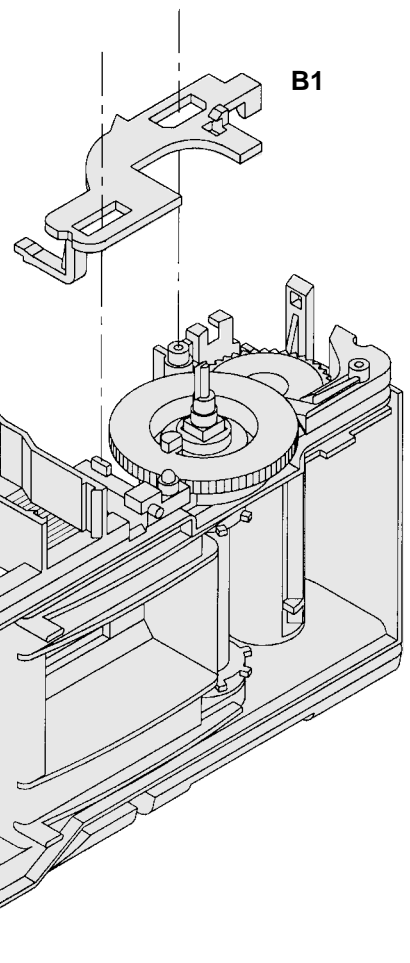
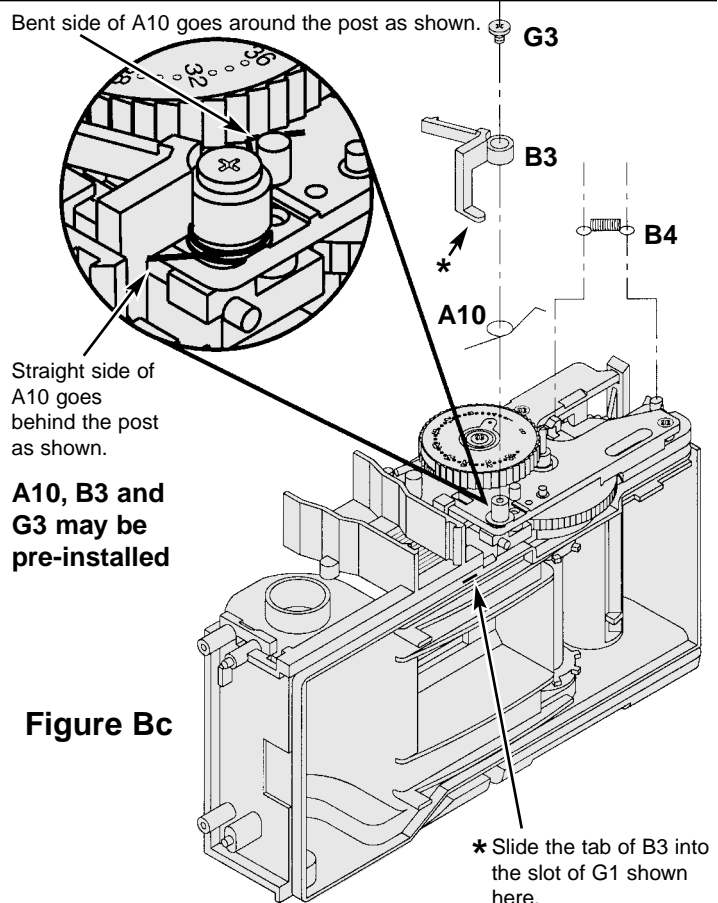
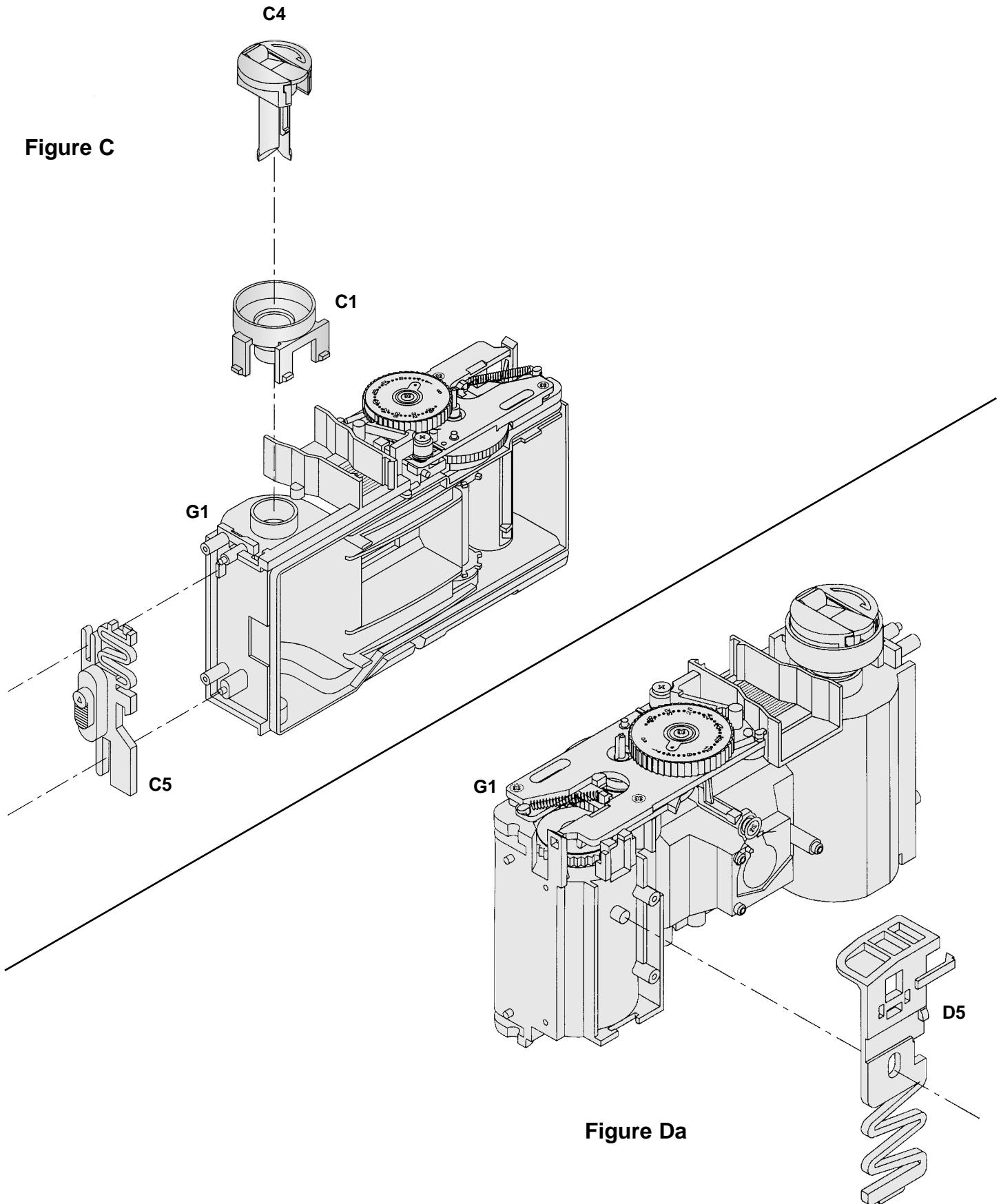


Figure Bb



- 4. **C Parts:** Assemble the C parts as shown in Figure C.
- 5. **D Parts:** Assemble the D parts as shown in Figures Da, Db, and Dc.



Notes:

- a) Before assembling D6, you may want to take a closer look at the lens.
Insert the lens into D6 with the dome side of the lens pointed out as shown in Figure Db.
- b) Place D8 over D7 as shown in Figure Db. Twist D8 in the direction shown and lock it into place.

Figure Db

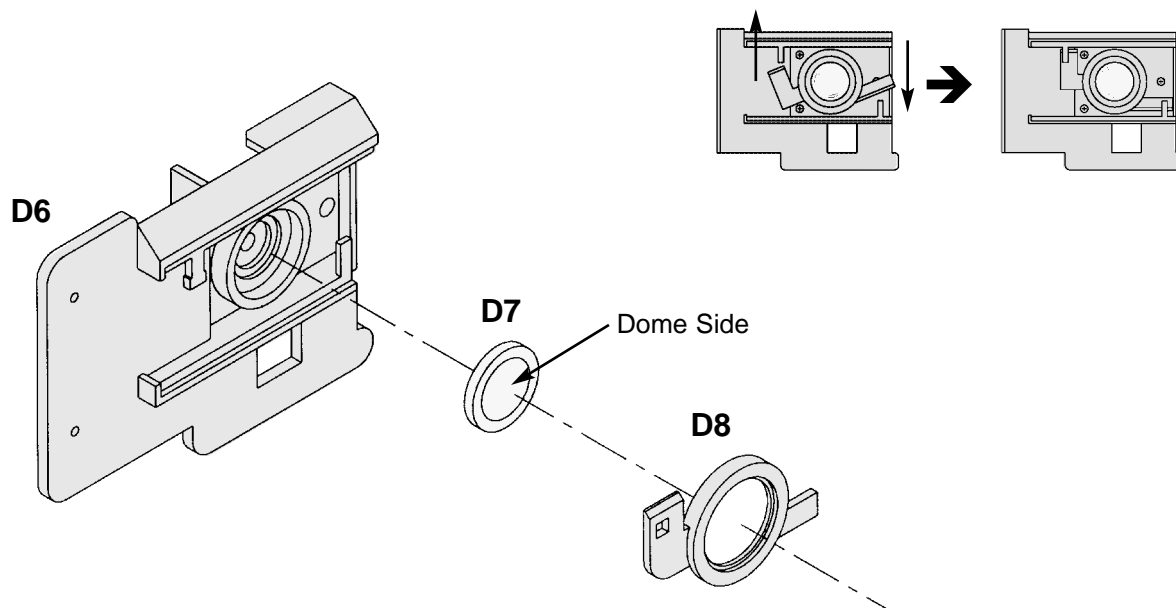
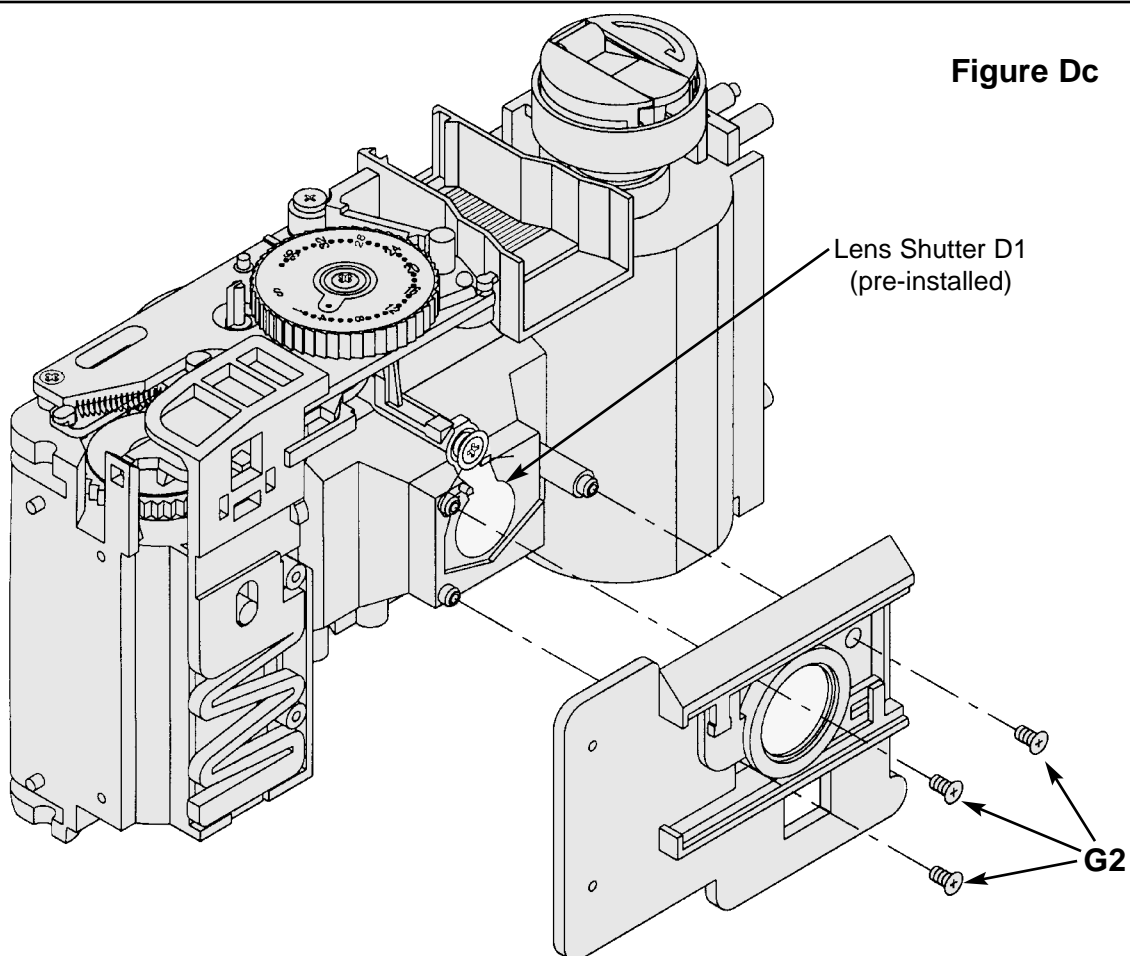


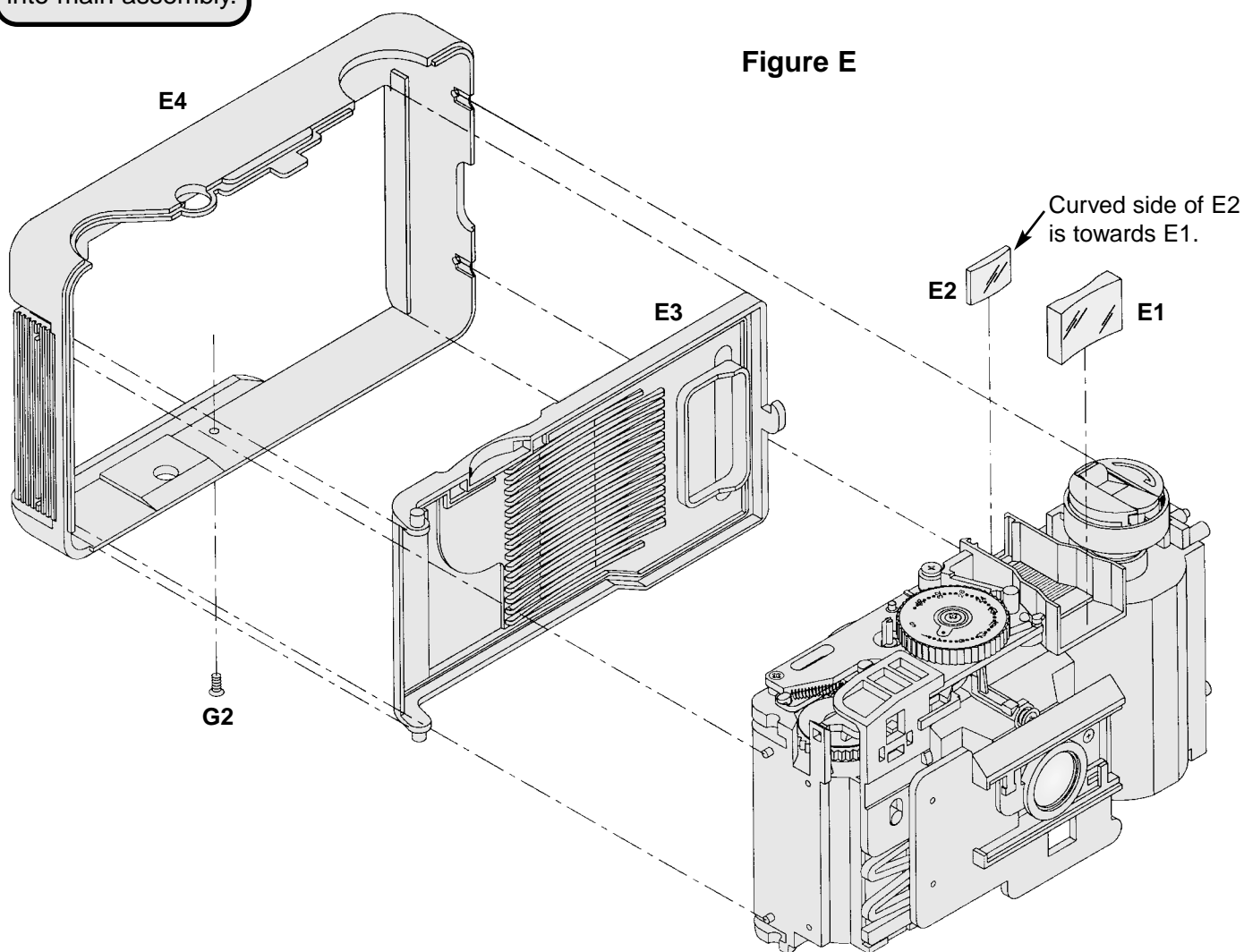
Figure Dc



- 6. **E Parts:** Assemble the E parts as shown in Figure E. Note that E1 and E2 have curved shapes and must be positioned properly or the viewfinder will give a distorted picture. E1 may be loose at this time, just be sure it is in position when you install F4 (the front case). You should install E3 into E4 and then install them onto the main assembly together, since installing E4 to the main assembly when E3 is already there will be difficult. E4 is secured with four snap holes on the sides and one G2 screw on the bottom (**note:** the screw is not used on all models).

- 7. **Test It:** Now is a good time to test your assembly. Press down on shutter release D5 (to take a picture) and you should hear a click as D1 (the lens shutter) rocks back and forth briefly allowing light to pass to the film area. If the back cover is open then you should see the shutter D1 open for an instant and then close (if not then check your assembly of the D parts). You should now be able to turn A9 (the film advance knob) around once to the right. Do this several times to make sure the shutter release and film advance mechanisms work smoothly. The film counter should advance one count each time the film is advanced. If you open the back cover then the film counter will be reset. If something is wrong then check your assembly above or refer to the troubleshooting section.

Install E3 into E4
before installing E4
into main assembly.



- 8. **F Parts:** Assemble the F parts as shown in Figure F. You may find it easier to lay F4 face-down with F1, F2, and F3 in it and then drop the main assembly in, or to hold button F2 in place with tape. Secure with four screws and your camera is complete.

Note:

You may wish to read the Mechanical Operation section of the Theory of Operation now.

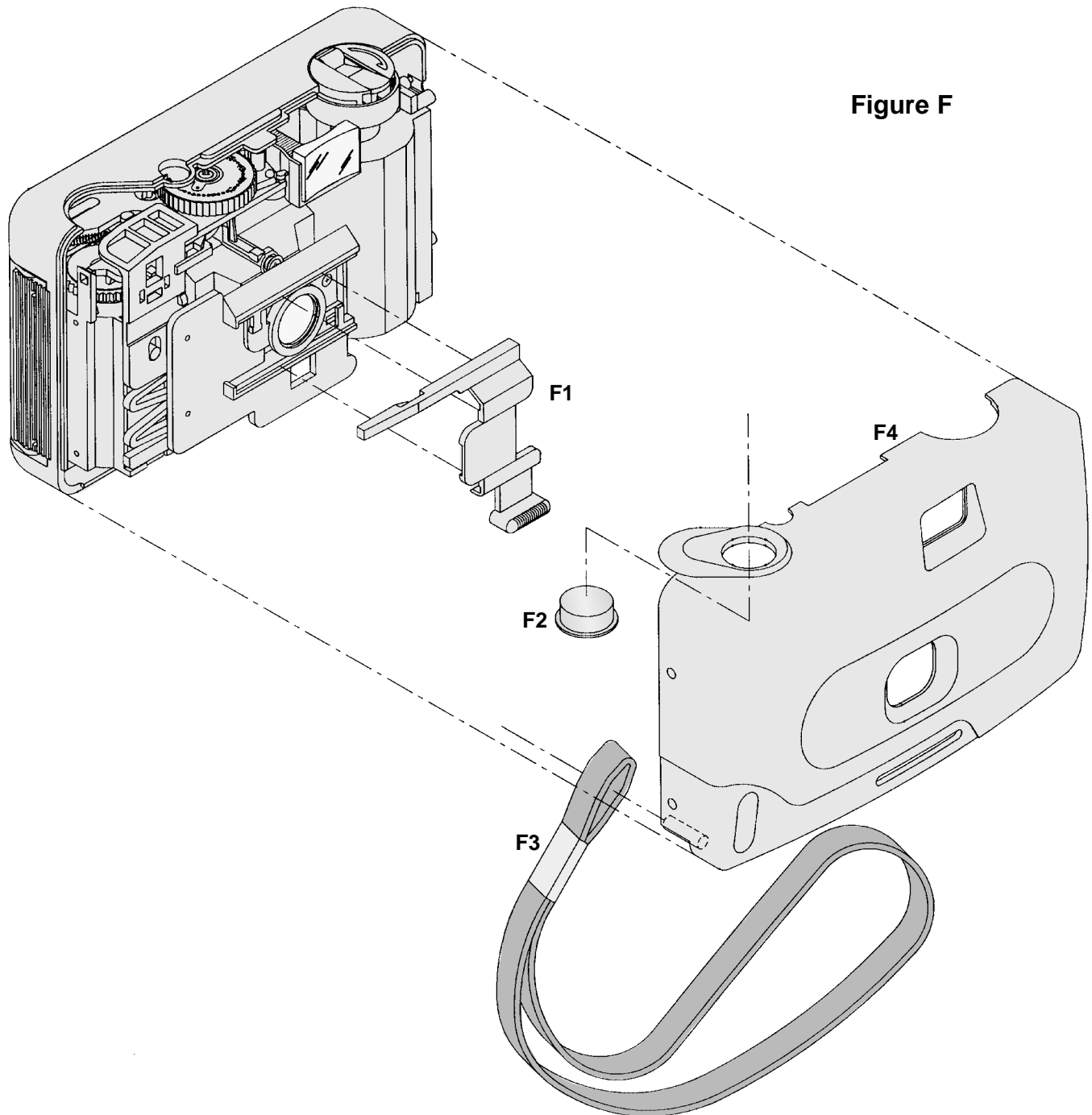


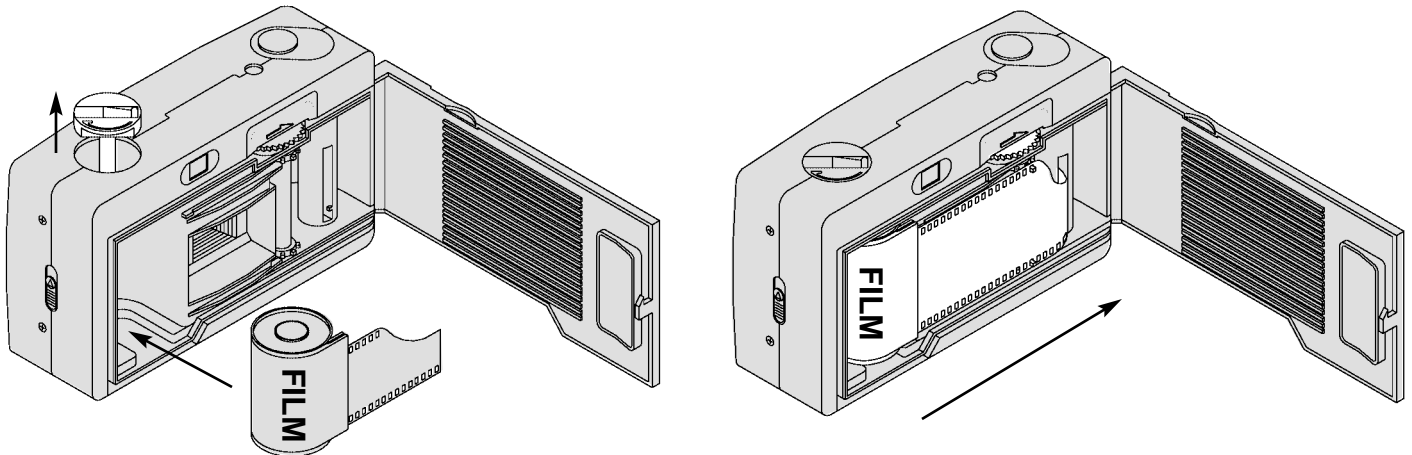
Figure F

OPERATING INSTRUCTIONS

Loading the Film:

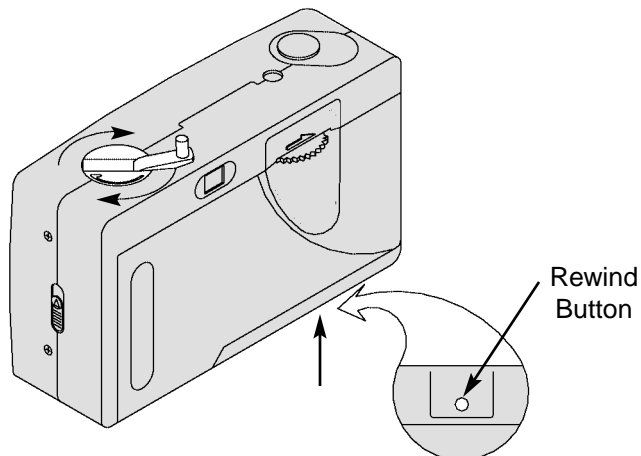
When handling film you should *always* keep out of direct sunlight.

1. Only use 35mm film, ISO 100, 200, or 400 speed. 400 speed is preferred because it is more sensitive to light, and this camera does not have flash. 100 speed should only be used outdoors and in sunshine, but will give more detailed pictures and is less expensive.
2. Open the back cover by pressing up on the film door latch.
3. Push up the rewind shaft (C4), insert the film as shown in, and push the rewind shaft down again to keep the film in place.
4. Pull the film and insert it into the film roller as shown. The film should now lay evenly in the camera and fit the teeth of film advance A1; if there is slack then use the film rewinder to wind the excess back into the film cartridge.
5. Close the back cover and open the lens cover. Press the shutter release button and advance the film several times until the film counter is in the 1 position. If the film does not advance then the film advance mechanism has not caught the film. Open the back cover and return to step 4.
6. Be sure the film door is closed and then close the lens cover until you are ready to take pictures.



Rewinding the Film:

1. Rewind the film when you reach the end of the roll. Take only the number of pictures specified on the roll.
2. While pressing the rewind button (film advance shaft A3 sticking out the camera bottom), flip out the rewind handle as shown and turn it clockwise (same as the arrow on it) until it locks. The film counter should now be in the "S" position.



3. Open the film door by pressing up on the film door latch.
4. Push up the rewind shaft and remove the film. It is ready to be developed. Take it to a local photofinisher.
5. Push down the rewind shaft and close the back cover unless you are ready to insert a new roll of film at this time.

Holding the Camera:

To get good pictures you must hold the camera properly. Your pictures will be out of focus if you move the camera even slightly while pressing the shutter button. For best results, hold the camera in both hands with one elbow against your body and be sure that the lens and viewfinder are not blocked by your hands or hair.

Taking Pictures:

1. Open the lens cover.
2. Look through the viewfinder and compose your picture as desired. You must be at least 4 feet away from your subject. **BE SURE YOU HAVE PLENTY OF LIGHT, ESPECIALLY WHEN TAKING PICTURES INDOORS.** Since this camera does not have flash, **NORMAL ROOM LIGHTING IS NOT ENOUGH.**
3. Press the shutter button gently to take your picture. **DO NOT SHAKE THE CAMERA** while doing this.
4. Turn the film advance to the right (same as the arrow on it) until it locks (once around). The film counter will have advanced by one. Check to see if you have used up all of the pictures on your roll of film.
5. Close the lens cover when finished taking pictures.

These Suggestions Will Help You Take Much Better Pictures:

By changing the camera's position, you can influence how your subject is represented.

1. This camera does not have flash, **SO BE SURE YOU HAVE PLENTY OF LIGHT WHEN TAKING PICTURES.** **NORMAL ROOM LIGHTING IS NOT ENOUGH.**
2. Position yourself at your subject's eye level. This is particularly important when taking pictures of children.
3. Keep unnecessary elements (such as passing cars, other people, signposts, telephone wires, etc.) out of the picture.
4. Be in a low position to intensify action and drama.
5. Use a vertical shot to emphasize the height of a subject (such as a waterfall).
6. To emphasize the background (such as for pretty scenery), place your subject off-center.
7. Be close to your subject, especially when taking pictures of people.
8. You do not need to limit yourself to only taking pictures on special occasions.

Handling Precautions:

1. You should never open the back cover except when you are changing film, since this will expose the film to light.
2. This camera is not waterproof and should not be used in rain or snow. If it is accidentally dropped in water then the camera will be all right after it has dried out, although any film in it may be ruined.
3. Be careful when using this camera around sand, as blowing sand may get inside and disrupt operation.
4. Do not store your camera or film where they may get very hot, such as the rear window shelf of a car on a hot day, or in direct sunlight.
5. Be very careful when cleaning the lens, as any dust or stains from cleaning fluid will show up in your pictures.

TROUBLESHOOTING GUIDE

Contact Elenco Electronics (our address/phone/e-mail is on the back of this manual) if you need additional assistance. **DO NOT** contact your place of purchase as they will not be able to help you.

Symptom: Camera does not take pictures (shutter does not work).

- Be sure the lens cover is open.
- Check your assembly of the D parts in step 5 of the assembly instructions.
- Be sure shutter control B1 is installed correctly.

Symptom: Film does not advance.

- Check that the G2 screws installed in assembly step 3 are in tight.
- Check the assembly of shutter control B1, spring B4, and film counter frame B2 in assembly step 3.
- Check your assembly of the A parts in step 2 of the assembly instructions.

Symptom: Film does not rewind.

- Re-read the operating instructions to make sure you are rewinding it properly.
- Check your assembly of the C parts in step 4 of the assembly instructions.

Symptom: Film counter does not count.

- Be sure the film door is properly closed.
- Be sure film counter reset B3 and spring A10 (or similar substitutes) are installed correctly. When the film door is closed B3 will lean against the film counter and prevent it from resetting.
- Be sure the tab on the top of film advance shaft A3 turns and advances the film counter one count each time the film is advanced.

Symptom: Film counter does not reset.

- The film counter should be reset (to zero) whenever the back cover is open.
- Be sure B3 and A10 (or similar substitutes) are installed correctly. When the film door is open B3 should not touch the film counter.
- Be sure the tab on the top of film advance shaft A3 does not touch the film counter except briefly when the film is being advanced.

Symptom: All pictures developed were blurred.

- Make sure that you are not shaking the camera when taking pictures.
- Re-read the "Suggestions for Taking Better Pictures" section of the operating instructions. Be sure you have enough light, especially indoors.
- Be sure the lens is clean. Make sure there are no stains on it from improper cleaning.
- Be sure you are using standard 35mm film. The film has an expiration date that refers to how long it may be stored before being used and developed; make sure your film's expiration date has not already passed. You should only be using film speeds of ASA 100, 200, or 400.
- Make sure that lens shutter D1 is working properly (you can check this without having film in the camera).

GLOSSARY

Absorbed	Sucked into.
Aperture	A small hole near the lens of a camera that controls the amount of light reaching the film.
ASA	American Standards Association, a rating system for film speeds.
Beam of Light	Very narrow band of light.
Blurred	When something cannot be seen clearly.
Bright	When something is producing or scattering a lot of light.
Brightness	The amount of light being produced by or scattered by something.
Camera	A device for taking photographs.
Converging Lens	A lens which makes beams of light come together.
Darkroom	A room where photofinishing work is done, lights are kept off to protect exposed film.
Depth of Field	How far around the focus distance things appear to be reasonably in focus.
Diverging Lens	A lens which makes beams of light separate.
Enlargements	Larger-than-normal pictures produced from film. Usually anything larger than 4"x6".
Exposure	When light reaches film, producing an image.
Field of View	What a camera (or your eyes) can see without moving.
Film	A material used to store images.
Film Speed	A measure of a film's sensitivity to light.
Flash	A camera feature that provides a burst of light toward the subject just before a picture is taken.
Focal Length	The length between the lens and the film in a camera.
Focus	To concentrate all of the light from an object into one point so that an image of the object may be produced.
in-focus	When a clear image of an object is produced.
out-of-focus	When a blurred image of an object is produced.
Focus Point	The point where beams of light from a converging lens meet. Place the film here for the best image.
Image	The pattern of light which is formed after light from something passes through a lens.
Infrared Light	A type of invisible light.
ISO	International Standards Organization, a rating system for film speeds.
Lens	A piece (or multiple pieces mounted together) of polished glass used to bend light.
Lens Shutter	The part of a camera that is opened to allow light to reach the film. Similar to the window shutters in some houses.
Magnifying Glass	A lens which is used to produce an enlarged image of something. Uses the same concepts as described here for cameras.
Nearsighted	Someone who cannot see distant objects clearly.
Photo Developing	Same as photofinishing.
Photofinishing	The process in which images on film are converted into pictures on special paper.
Photography	Producing images on light-sensitive material.
Point and Shoot Camera	Easy to use cameras that have a fixed focus setting or automatic focus adjustment.
Scattered	Spread around.
Shutter Speed	How quickly the lens shutter opens and closes, allowing light to reach the film.
Silver Compounds	A light-sensitive material used to make film.
Subject	What you are taking a picture of.
Telephoto	A close-up photograph, the same as zooming-in.
Time-Lapse Photography	Using several exposures spread over time or one continuous exposure to show how something moves.
Viewfinder	The part of a camera that allows you to see what you are taking a photograph of.
Zoom	A lens in which the focal length may be adjusted while keeping focus on the subject.
Zooming-in	Increasing the focal length so that the subject appears larger.
Zooming-out	Decreasing the focal length so that the subject appears smaller.

QUIZ

1. The color of something is really the color of light that was _____ by it.
2. On a cold but sunny day, someone wearing a dark purple shirt will be _____ than someone wearing a white shirt.
3. The focus point is where you want to place the _____ for the best image.
4. "Zooming-in" means we are _____ the focal length.
5. Your eyes see things the same way as using a lens with a _____ focal length.
6. The _____ controls the amount of light reaching the film.
7. When taking pictures of subjects that are moving it is best to use a _____ shutter speed and a _____ film speed.
8. The only colors used on a TV screen are _____, _____, and _____.
9. Faster speed film is _____ sensitive to light than slower speed film.
10. To get better pictures of people at close distances but in low light you can use _____, a larger aperture, a faster shutter speed, or _____ film.

Answers: 1. scattered; 2. warmer; 3. film; 4. increasing; 5. 50mm or 2 inch; 6. aperture; 7. fast; fast; 8. blue, red, and green; 9. more; 10. flash, faster.

FOR FURTHER READING (try your local bookstore or library)

- R. Woodson (1996). *The Complete Idiot's Guide to Photography*. Alpha Books.
- M. Langford (1992). *Learn Photography in a Weekend*. Knopf.
- M. Joseph & D. Saunders (1993). *The Complete Photography Course*. Penguin Books.
- J. Hedgecoe (1993). *John Hedgecoe's Photography Basics*. Sterling Publishing.
- J. Schaefer (1992). *An Ansel Adams Guide: Basic Techniques of Photography*. Little, Brown, & Co.
- J. Hedgecoe (1992). *The Photographer's Handbook*. Knopf.

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